Hours of mean time.	KEW.—Humidity of the Air. January.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	NERTCHINSK.— January.	Feb.	March.	April.	May.	June.
0.	85	72	66	63	63	53	52	62	62	72	80	84	91	89	73	56	39	57
1.	85	69	65	61	60	52	49	61	60	69	77	81	91	87	71	53	41	56
2.	83	67	64	60	57	52	47	61	59	68	74	81	89	86	70	53	41	55
3.	83	66	64	59	57	50	46	60	58	69	74	83	88	85	69	51	40	54
4.	89	67	65	60	56	50	45	58	61	74	76	84	84	83	68	51	39	56
5.	89	68	68	61	57	50	47	62	60	77	80	84	82	82	68	48	36	58
6.	91	73	75	66	59	51	50	65	69	81	81	87	82	81	68	56	42	59
7.	93	76	75	69	63	55	54	69	75	78	82	87	82	81	69	61	48	64
8.	89	78	79	75	69	62	60	75	79	88	84	87	82	82	70	64	52	70
9.	91	81	81	80	77	68	65	77	81	87	84	88	82	82	72	67	55	73
10.	88	82	81	79	81	74	69	80	84	88	85	87	84	82	72	68	59	74
11.	88	82	83	82	83	77	72	82	85	90	85	87	84	81	72	69	61	75
12.	88	84	85	85	86	79	74	84	88	91	85	87	84	81	73	71	64	79
13.	88	82	85	88	88	83	77	88	87	91	85	87	86	81	73	71	65	80
14.	88	84	87	88	89	85	78	88	88	91	85	87	85	82	75	73	66	81
15.	86	84	87	86	89	86	81	89	88	91	89	87	86	82	75	74	68	82
16.	86	82	87	90	89	87	83	91	90	91	89	87	86	81	76	74	66	83
17.	88	85	89	90	91	87	82	91	90	93	87	87	84	82	76	76	71	83
18.	90	85	93	88	88	82	80	89	88	96	87	87	84	82	76	75	70	81
19.	90	85	93	88	87	75	75	85	91	96	91	90	86	84	78	74	64	78
20.	88	91	97	82	80	69	72	78	85	94	85	88	88	88	81	69	58	73
21.	90	90	80	76	74	64	67	74	86	90	85	87	87	89	81	63	54	68
22	87	81	74	71	66	59	61	70	75	84	85	87	89	90	78	59	50	64
23.	89	87	70	67	65	57	56	67	70	77	86	85	89	90	74	57	47	60
Means	88	79	79	76	74	67	64	75	78	84	83	86	86	84	73	64	54	69

XII. "On the Connexion between oppositely disposed Currents of Air and the Weather subsequently experienced in the British Islands." By Robert H. Scott, M.A., Director of the Meteorological Office. Communicated by the President. Received June 17, 1869.

In the number of the 'Proceedings of the Meteorological Society' for February 1869, there is a paper by Mr. Charles Meldrum, of the Mauritius, on the connexion between the rotation of the wind in the Southern Indian Ocean and the positions of oppositely directed air-currents. In this paper the author expresses his opinion that the tropical hurricanes of the Southern Indian Ocean *invariably* originate between two opposite streams of air.

More than a year previous to the appearance of Mr. Meldrum's paper my own attention had been drawn to the occurrence in these islands of some remarkable storms, which appeared to be connected with the previous existence at the earth's surface of the two wind-currents, polar and equatorial, in close proximity to each other.

The first occasion on which this was noticed by me was on January 22,

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Humidity of the Air.						BARNAOUL.—Humidity of the Air.												
July.	August.	Sep	October.	Nov.	Dec.	January.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	Hours of mean time.
63	63	59	60	81	86	93	94	85	56	47	51	56	59	64	66	82	94	0.
60	60	56	58	79	86	93	94	84	55	45	50	55	62	63	65	79	95	1.
59	58	55	58	78	85	93	94	83	53	45	50	54	57	62	62	79	95	2.
58	57	50	57	76	79	94	93	83	52	45	51	55	56	62	63	79	95	3.
58	57	52	60	75	76	93	94	83	53	45	52	56	56	63	64	80	96	4.
61	59	55	62	75	74	93	93	83	55	46	52	57	58	65	67	81	95	5.
64	65	60	66	74	73	94	93	85	57	48	53	61	63	69	69	82	94	6.
70	71	71	68	73	74	94	94	85	62	52	58	65	68	73	69	84	95	7.
75	75	72	70	73	74	94	94	86	65	57	64	72	73	76	72	85	94	8.
79	79	75	71	73	75	94	94	87	68	62	68	77	77	78	74	86	94	9.
82	80	78	71	73	76	94	95	88	70	65	74	80	80	80	76	86	94	10.
82	82	78	72	74	76	94	95	88	72	68	76	84	82	82	77	86	95	11.
84	84	77	72	74	75	94	96	89	73	72	78	85	84	83	79	86	95	12.
86	85	79	73	74	74	94	96	90	75	74	80	87	86	84	80	86	96	13.
87	86	80	74	73	73	94	96	91	77	76	81	88	87	86	80	87	96	14.
88	88	81	74	74	76	94	96	92	79	78	83	90	89	86	81	87	96	15.
89	88	82	76	74	78	95	96	92	80	80	84	91	90	87	81	88	95	16.
89	89	82	76	72	78	95	96	92	81	78	81	89	90	88	82	88	95	17.
88	90	83	75	74	77	95	96	92	79	74	78	86	89	88	82	89	95	18.
86	89	82	78	75	77	95	97	92	76	71	72	82	86	85	81	89	96	19.
79	84	77	78	76	77	95	97	92	74	64	69	77	82	82	80	89	96	20.
74	79	70	72	81	79	95	97	91	66	58	62	70	76	78	76	88	96	21.
70	73	67	68	82	82	95	96	89	61	53	58	63	69	73	73	86	95	22.
66	67	63	64	81	84	94	96	86	58	51	55	60	62	67	71	84	95	23.
75	75	70	69	76	78	94	95	88	67	61	66	72	74	76	74	85	95	Means

1868, when the atmospherical conditions over these islands were very remarkable; easterly winds were prevalent over the central and northern portions of the area, while in France there were strong westerly gales. The channels of the currents were so close to each other that, while at Yarmouth there was a strong easterly wind, there was a westerly gale at Portsmouth. The contrast exhibited by the two currents as regards temperature was very marked, and a dense fog was experienced in London. Barometrical readings were very low over the region which separated the districts of the respective currents. Next day pressure rose very rapidly; but this was only the precursor of an equally sudden diminution of its amount, and of the advent of the equatorial current which swept with great violence over these islands, producing a very serious southerly gale on the 24th of January.

On the 8th of December last, conditions similar to those of January 22 were observed. Strong easterly winds were reported from Scarborough, while westerly winds of great force prevailed in the Channel and in France. This state of things was succeeded, after an interval of two days, by a southerly storm, the whole sequence of phenomena resembling very closely what had been noticed eleven months before.

In order to trace out this remarkable succession of occurrences, it was resolved to examine all the cases in which the polar and equatorial currents made their appearance at the surface of the ground within the area of the British Islands, and to record the phases of weather which ensued. As these currents flow in opposite directions, it is evident that they must move in channels approximatively parallel to each other, so that there are only two cases to be examined.

I. The polar current flows in a latitude higher than the equatorial current.

II. The polar current flows in a latitude lower than the equatorial current.

The daily weather reports for a period of 27 months have been examined, and the result has been that 27 instances of case I. and 30 of case II. have been discovered.

These instances are all enumerated in two tables, which are herewith submitted*.

In accordance with the relation between the motion of the wind and the distribution of atmospherical pressure which has been laid down by Prof. Buys Ballot, viz. that barometrical readings are lower on the left-hand side of a current of air than on the right, we should expect to find that in case I. there would be a relative barometrical minimum, and in case II. a relative barometrical maximum between the currents. This supposition is found to be abundantly confirmed by the observations.

As regards the weather subsequently experienced, Mr. Meldrum states that when the two currents, the N.W. monsoon and S.E. trade, are noticed simultaneously over the Indian Ocean, the channel of the latter lying on the southern edge of that of the former, *i.e.* in a latitude higher than it, the barometer between them is low and falling. Ultimately the reduction of pressure becomes greater at one point than at the others, and a centre of barometrical depression is formed, resulting eventually in a cyclone.

In the instances which form the subject of the present paper, we have not been able to trace the actual genesis of a storm within the limits of our area of observation. Most of our storms come on us from the Atlantic, and are apparently not formed in the immediate district from which our reports are derived. The result of the investigation appears, however, to show that whereas the conditions of case I. are indicative of considerable atmospherical disturbance, those of case II. seem to show that winds will probably be light for some days.

Case I. The polar current flows in a latitude higher than the equatorial current.

In other words, easterly winds prevail in the north, westerly in the south. Northerly and southerly winds are nearly entirely absent.

Twenty-seven instances have been noticed of these conditions, and they

* The Tables are necessarily so condensed that they would hardly be intelligible if printed with the paper.

are very generally followed after a brief interval by a serious barometrical depression, frequently resulting in a southerly gale.

In 12 instances a southerly gale followed in 2 days.
„ 4 „ „ „ „ 3 days.
„ 6 „ fresh southerly winds, not a gale, followed.
„ 2 „ a north-east gale followed.
„ 2 „ a southerly gale set in at once.
„ 1 „ no change of weather ensued.

27

These facts appear to show that the conditions of case I. indicate a deep-seated disturbance of the atmosphere. In almost every case they seem to point to the existence, or at least the formation, of a barometrical minimum over the Atlantic Ocean, which will probably advance to our coasts and result in a southerly storm. On only two occasions did the centre of the disturbance pass to the southward of these islands, viz. the two instances in which the north-easterly gale followed.

Case II. The polar current flows in a latitude lower than the equatorial current.

In other words, easterly winds prevail in the south, westerly in the north.

Thirty instances have been noticed.

In 11 instances no change of weather ensued.
7 „ The polar current completely displaced the equatorial current over these islands, and easterly winds set in.
7 „ This displacement was only partial, and north-westerly winds set in.
5 „ Southerly gales or fresh southerly winds followed.

30

It would appear from the foregoing that case II. is not, as a rule, indicative of the approach of a serious atmospherical disturbance, although such did occur in five instances (one-sixth of the total number under consideration). In the great predominance of instances the weather either remained unchanged and calm, or else the polar current succeeded in displacing the equatorial more or less completely, and the winds which prevailed over these islands generally were from points between N.W. and E.

It is obvious that, from the very limited area from which our observations are derived, we are at present unable to examine into the mutual action of the currents on each other (unaffected by any influence exerted on the wind by inequalities in the earth's surface, such as those produced by an irregular coast-line stretching out into the open sea), as has been done by Mr. Meldrum for the Indian Ocean; but it is hoped that this commencement of an attempt to trace a connexion between successive conditions of weather may be deemed worthy of the notice of the Royal Society.